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     (FILE 'HOME' ENTERED AT 13:10:14 ON 06 OCT 2009)

     FILE 'HCAPLUS' ENTERED AT 13:11:09 ON 06 OCT 2009
L1              1 SEA SPE=ON  ABB=ON  PLU=ON  US20060251952/PN
                  D L1 ALL
                  SAV L1 HAI637/A
                  SEL L1 RN

     FILE 'REGISTRY' ENTERED AT 13:12:34 ON 06 OCT 2009
L2             82 SEA SPE=ON  ABB=ON  PLU=ON  (1333-74-0/BI OR 67-56-1/BI
                  OR 7440-06-4/BI OR 7782-44-7/BI OR 821770-72-3/BI OR
                  821770-73-4/BI OR 821770-74-5/BI OR 821770-75-6/BI OR
                  821770-76-7/BI OR 821770-77-8/BI OR 821770-78-9/BI OR
                  821770-79-0/BI OR 821770-80-3/BI OR 821770-81-4/BI OR
                  821770-82-5/BI OR 821770-83-6/BI OR 821770-84-7/BI OR
                  821770-85-8/BI OR 821770-86-9/BI OR 821770-87-0/BI OR
                  821770-88-1/BI OR 821770-89-2/BI OR 821770-90-5/BI OR
                  821770-91-6/BI OR 821770-92-7/BI OR 821770-93-8/BI OR
                  821770-94-9/BI OR 821770-95-0/BI OR 821770-96-1/BI OR
                  821770-97-2/BI OR 821770-98-3/BI OR 821770-99-4/BI OR
                  821771-00-0/BI OR 821771-01-1/BI OR 821771-02-2/BI OR
                  821771-03-3/BI OR 821771-04-4/BI OR 821771-05-5/BI OR
                  821771-06-6/BI OR 821771-07-7/BI OR 821771-08-8/BI OR
                  821771-09-9/BI OR 821771-10-2/BI OR 821771-11-3/BI OR
                  821771-12-4/BI OR 821771-13-5/BI OR 821771-14-6/BI OR
                  821771-15-7/BI OR 821771-16-8/BI OR 821771-17-9/BI OR
                  821771-18-0/BI OR 821771-19-1/BI OR 821771-20-4/BI OR
                  821771-21-5/BI OR 821771-22-6/BI OR 821771-23-7/BI OR
                  821771-24-8/BI OR 821771-25-9/BI OR 821771-27-1/BI OR
                  821771-28-2/BI OR 821771-29-3/BI OR 821771-30-6/BI OR
                  821771-31-7/BI OR 821771-32-8/BI OR 821771-33-9/BI OR
                  821771-34-0/BI OR 821771-35-1/BI OR 821771-36-2/BI OR
                  821771-37-3/BI OR 821771-38-4/BI OR 821771-39-5/BI OR
                  821771-40-8/BI OR 821771-41-9/BI OR 821771-42-0/BI OR
                  821771-43-1/BI OR 821771-44-2/BI OR 821771-45-3/BI OR
                  821771-46-4/BI OR 821771-47-5/BI OR 821771-48-6/BI OR
                  821771-49-7/BI OR 821771-50-0/BI)
                  SAV L2 HAI637A/A
                  D SCA
L3         138209 SEA SPE=ON  ABB=ON  PLU=ON  ?PLATINUM?/CNS
L4         893254 SEA SPE=ON  ABB=ON  PLU=ON  ?ALLOY?/CNS
L5          13786 SEA SPE=ON  ABB=ON  PLU=ON  L3 AND L4
L6          91731 SEA SPE=ON  ABB=ON  PLU=ON  ?ATOMIC?/CNS
L7           4302 SEA SPE=ON  ABB=ON  PLU=ON  L5 AND L6
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              E ATOMIC/CN
L8        4302 SEA SPE=ON  ABB=ON  PLU=ON  L5 AND ATOMIC




     FILE 'ZCAPLUS' ENTERED AT 14:21:54 ON 06 OCT 2009
L9              QUE SPE=ON  ABB=ON  PLU=ON  ATOMIC#
L10             QUE SPE=ON  ABB=ON  PLU=ON  PCT# OR PERCENT?
L11             QUE SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L12             QUE SPE=ON  ABB=ON  PLU=ON  L9 (2W) %

     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
     HCAPLUS' ENTERED AT 14:24:18 ON 06 OCT 2009

     FILE 'ZCAPLUS' ENTERED AT 14:27:12 ON 06 OCT 2009
L13             QUE SPE=ON  ABB=ON  PLU=ON  21 OR 22 OR 23 OR 24 OR 25
                OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR
                35 OR 36 OR 37 OR 38 OR 39 OR 40


     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
     HCAPLUS' ENTERED AT 14:29:12 ON 06 OCT 2009
L14        432 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L15        527 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L16        480 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L17        690 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L18        108 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L19       1341 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L20        972 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L21       1113 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
L22       1830 SEA SPE=ON  ABB=ON  PLU=ON  L9 (3W) L10
     TOTAL FOR ALL FILES
L23       7493 SEA SPE=ON  ABB=ON  PLU=ON  L11


L24             QUE SPE=ON  ABB=ON  PLU=ON  1 OR 2 OR 3 OR 4 OR 5 OR 6
                OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16
                OR 17 OR 18 OR 19 OR 20

     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
     HCAPLUS' ENTERED AT 14:31:14 ON 06 OCT 2009
L25        181 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L14
L26        329 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L15
L27        166 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L16
L28        378 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L17
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L29          30 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L18
L30         663 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L19
L31         452 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L20
L32         644 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L21
L33         806 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L22
     TOTAL FOR ALL FILES
L34        3649 SEA SPE=ON  ABB=ON  PLU=ON  (L24 OR L13) (4A) L23
                D L34 KWIC


     FILE 'ZCAPLUS' ENTERED AT 14:35:17 ON 06 OCT 2009
L35             QUE SPE=ON  ABB=ON  PLU=ON  PLATINUM#

     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
     HCAPLUS' ENTERED AT 14:35:31 ON 06 OCT 2009
L36           0 SEA SPE=ON  ABB=ON  PLU=ON  L25 (4A) L35
L37           2 SEA SPE=ON  ABB=ON  PLU=ON  L26 (4A) L35
L38           0 SEA SPE=ON  ABB=ON  PLU=ON  L27 (4A) L35
L39           2 SEA SPE=ON  ABB=ON  PLU=ON  L28 (4A) L35
L40           0 SEA SPE=ON  ABB=ON  PLU=ON  L29 (4A) L35
L41           1 SEA SPE=ON  ABB=ON  PLU=ON  L30 (4A) L35
L42           2 SEA SPE=ON  ABB=ON  PLU=ON  L31 (4A) L35
L43           9 SEA SPE=ON  ABB=ON  PLU=ON  L32 (4A) L35
L44           8 SEA SPE=ON  ABB=ON  PLU=ON  L33 (4A) L35
     TOTAL FOR ALL FILES
L45          24 SEA SPE=ON  ABB=ON  PLU=ON  L34 (4A) L35
                D L43 2-6 KWIC

     FILE 'REGISTRY' ENTERED AT 14:36:56 ON 06 OCT 2009
                E PLATINUM/CN
                E PLATINUM 1-40/CN
                E PLATINUM 2-40/CN
                E PLATINUM 40/CN
                E CHROMIUM 5-25/CN
L46       56840 SEA SPE=ON  ABB=ON  PLU=ON  ?CHROMIUM?/CNS AND ?NICKEL?/C
                NS
L47         148 SEA SPE=ON  ABB=ON  PLU=ON  L46 AND L3
                D L47 1-10 CN
L48          70 SEA SPE=ON  ABB=ON  PLU=ON  L47 AND L6
                D L48 9-12 CN

     FILE 'REGISTRY' ENTERED AT 14:43:46 ON 06 OCT 2009
                E PLATINUM 1/CN
                E BERYLLIUM 14-25/CN
                E PLATINUM 1-40/CN

     FILE 'HCAPLUS' ENTERED AT 14:46:12 ON 06 OCT 2009
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L49          42 SEA SPE=ON  ABB=ON  PLU=ON  L48
L50       10606 SEA SPE=ON  ABB=ON  PLU=ON  PLATINUM#(2W)ALLOY#
L51           8 SEA SPE=ON  ABB=ON  PLU=ON  L49 AND L50

     FILE 'REGISTRY' ENTERED AT 14:49:07 ON 06 OCT 2009
L52         538 SEA SPE=ON  ABB=ON  PLU=ON  PT (L) CR (L) NI/ELS
L53         313 SEA SPE=ON  ABB=ON  PLU=ON  L52 (L) 3-6/ELC.SUB
L54       11888 SEA SPE=ON  ABB=ON  PLU=ON  ?PLATINUM ALLOY?/CNS
L55         157 SEA SPE=ON  ABB=ON  PLU=ON  L54 AND L53
L56          26 SEA SPE=ON  ABB=ON  PLU=ON  L55 AND L9


     FILE 'HCAPLUS' ENTERED AT 14:52:12 ON 06 OCT 2009
L57          14 SEA SPE=ON  ABB=ON  PLU=ON  L56
L58           5 SEA SPE=ON  ABB=ON  PLU=ON  L51 NOT L57
L59          19 SEA SPE=ON  ABB=ON  PLU=ON  L58 OR L57



     FILE 'JAPIO, ENERGY, INSPEC, COMPENDEX, WPIX, HCAPLUS' ENTERED AT
     15:26:49 ON 06 OCT 2009
L60          22 DUP REMOV L45 (2 DUPLICATES REMOVED)
                    ANSWERS '1-2' FROM FILE JAPIO
                    ANSWERS '3-4' FROM FILE ENERGY
                    ANSWER '5' FROM FILE INSPEC
                    ANSWER '6' FROM FILE COMPENDEX
                    ANSWERS '7-15' FROM FILE WPIX
                    ANSWERS '16-22' FROM FILE HCAPLUS

     FILE 'REGISTRY' ENTERED AT 15:27:22 ON 06 OCT 2009
                E PLATINUM 1/CN
                E PLATINUM 2/CN

     FILE 'HCAPLUS' ENTERED AT 15:29:41 ON 06 OCT 2009
L61        2969 SEA SPE=ON  ABB=ON  PLU=ON  L35 (4W) (L24 OR L13) (4W)
                L9
                D L61 KWIC

     FILE 'ZCAPLUS' ENTERED AT 15:31:35 ON 06 OCT 2009
L62             QUE SPE=ON  ABB=ON  PLU=ON  CHROMIUM#
L63             QUE SPE=ON  ABB=ON  PLU=ON  5 OR 6 OR 7 OR 8 OR 9 OR 10
                OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18 OR 19 OR
                20 OR 21 OR 22 OR 23 OR 24 OR 25
L64             QUE SPE=ON  ABB=ON  PLU=ON  L62 (4W) L63 (4W) L9

     FILE 'HCAPLUS' ENTERED AT 15:34:09 ON 06 OCT 2009
L65        4901 SEA SPE=ON  ABB=ON  PLU=ON  L62 (4W) L63 (4W) L9
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L66         2412 SEA SPE=ON  ABB=ON  PLU=ON  L35 (W) (L24 OR L13) (4W) L9


L67         3234 SEA SPE=ON  ABB=ON  PLU=ON  L62 (W) L63 (4W) L9

L68          636 SEA SPE=ON  ABB=ON  PLU=ON  L66 AND L67

     FILE 'ZCAPLUS' ENTERED AT 15:38:30 ON 06 OCT 2009
L69              QUE SPE=ON  ABB=ON  PLU=ON  NICKEL#
L70              QUE SPE=ON  ABB=ON  PLU=ON  45 OR 46 OR 47 OR 48 OR 49
                 OR 50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56 OR 57 OR 58 OR
                 59 OR 60 OR 61 OR 62 OR 63 OR 64 OR 65 OR 66 OR 67 OR 68
                 OR 69 OR 70
L71              QUE SPE=ON  ABB=ON  PLU=ON  L69 (W) L70 (4W) L9

     FILE 'HCAPLUS' ENTERED AT 15:40:04 ON 06 OCT 2009
L72         9476 SEA SPE=ON  ABB=ON  PLU=ON  L69 (W) L70 (4W) L9
                 D L72 8-10 KWIC
L73           60 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND L72
                 D L73 9-12 KWIC
L74      1699944 SEA SPE=ON  ABB=ON  PLU=ON  CAT# OR CATAL?
L75            0 SEA SPE=ON  ABB=ON  PLU=ON  L73 AND L74
L76            0 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND L74
L77            0 SEA SPE=ON  ABB=ON  PLU=ON  L59 AND L74

     FILE 'ZCAPLUS' ENTERED AT 15:45:28 ON 06 OCT 2009
L78              QUE SPE=ON  ABB=ON  PLU=ON  CAT# OR CATAL?

     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX'
     ENTERED AT 15:46:14 ON 06 OCT 2009
                 D HI

L79            0 SEA L60
L80            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L79

L81            2 SEA L60
L82            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L81

L83            0 SEA L60
L84            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L83

L85            2 SEA L60
L86            1 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L85

L87            0 SEA L60
L88            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L87
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L89            1 SEA L60
L90            1 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L89

L91            1 SEA L60
L92            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L91

L93            9 SEA L60
L94            3 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L93
     TOTAL FOR ALL FILES
L95            5 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L60

     FILE 'PASCAL, JAPIO, METADEX, ENERGY, EMA, INSPEC, COMPENDEX, WPIX,
     HCAPLUS' ENTERED AT 15:47:06 ON 06 OCT 2009

L96            0 SEA L60
L97            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L96

L98            2 SEA L60
L99            0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L98

L100           0 SEA L60
L101           0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L100

L102           2 SEA L60
L103           1 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L102

L104           0 SEA L60
L105           0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L104

L106           1 SEA L60
L107           1 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L106

L108           1 SEA L60
L109           0 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L108

L110           9 SEA L60
L111           3 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L110

L112           7 SEA L60
L113           5 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L112
     TOTAL FOR ALL FILES
L114          10 SEA SPE=ON  ABB=ON  PLU=ON  L78 AND L60


     FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' ENTERED AT 15:50:26 ON 06 OCT
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     2009
L115          10 DUP REMOV L114 (0 DUPLICATES REMOVED)
                    ANSWER '1' FROM FILE ENERGY
                    ANSWER '2' FROM FILE INSPEC
                    ANSWERS '3-5' FROM FILE WPIX
                    ANSWERS '6-10' FROM FILE HCAPLUS

     FILE 'HCAPLUS' ENTERED AT 15:53:20 ON 06 OCT 2009
L116       14638 SEA SPE=ON  ABB=ON  PLU=ON  L35 (4W) (L24 OR L13)
L117        3167 SEA SPE=ON  ABB=ON  PLU=ON  L116 (L) ATOMIC#
                D L117 9-12 KWIC
L118        2992 SEA SPE=ON  ABB=ON  PLU=ON  L116 (10W) ATOMIC#
L119         498 SEA SPE=ON  ABB=ON  PLU=ON  L117 AND L74
                D L119 5-10 KWIC
L120          19 SEA SPE=ON  ABB=ON  PLU=ON  L119 AND L62
L121          71 SEA SPE=ON  ABB=ON  PLU=ON  L119 AND L69
L122          12 SEA SPE=ON  ABB=ON  PLU=ON  L121 AND L62
                D L122 5-10 KWIC
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FILE HOME

FILE HCAPLUS

FILE COVERS 1907 - 6 Oct 2009 VOL 151 ISS 15
FILE LAST UPDATED: 5 Oct 2009 (20091005/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2009
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2009

HCAplus now includes complete International Patent Classification (I reclassification data for the third quarter of 2009.

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This file contains CAS Registry Numbers for easy and accurate

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FILE REGISTRY
Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 4 OCT 2009 HIGHEST RN 1187307-68-1
DICTIONARY FILE UPDATES: 4 OCT 2009 HIGHEST RN 1187307-68-1

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TSCA INFORMATION NOW CURRENT THROUGH June 26, 2009.

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FILE LREGISTRY
LREGISTRY IS A STATIC LEARNING FILE

CAS INFORMATION USE POLICIES, ENTER HELP USAGETERMS FOR DETAILS.

FILE ZCAPLUS

FILE COVERS 1907 - 6 Oct 2009 VOL 151 ISS 15
FILE LAST UPDATED: 5 Oct 2009 (20091005/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Aug 2009
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Aug 2009

ZCAplus now includes complete International Patent Classification (I reclassification data for the third quarter of 2009.

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LCA IS A STATIC LEARNING FILE

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substance identification.

FILE PASCAL
FILE LAST UPDATED: 5 OCT 2009       <20091005/UP>
FILE COVERS 1977 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE
    IN THE BASIC INDEX (/BI) FIELD  <<<

FILE JAPIO
FILE LAST UPDATED:            30 SEP 2009       <20090930/UP>
MOST RECENT PUBLICATION DATE: 25 JUN 2009       <20090625/PD>
>>> GRAPHIC IMAGES AVAILABLE <<<

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION (SLART) IS AVAILABLE
    IN THE BASIC INDEX (/BI) FIELD <<<

FILE METADEX
FILE LAST UPDATED: 22 SEP 2009       <20090922/UP>
FILE COVERS 1966 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN THE
    BASIC INDEX (/BI) <<<

>>> METADEX will load additionally newly included old documents.
    If you are not interested in retrieving these older documents
    we recommend to modify your SDI by excluding them by publication
    year (PY). E.G. => NOT PY<XXXX <<<

FILE ENERGY
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FILE LAST UPDATED: 6 OCT 2009       <20091006/UP>
FILE COVERS 1974 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
    THE BASIC INDEX >>>

FILE EMA
FILE LAST UPDATED: 22 SEP 2009       <20090922/UP>
FILE COVERS 1986 TO DATE.

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    If you are not interested in retrieving these older documents
    we recommend to modify your SDI by excluding them by publication
    year (PY). E.G. => NOT PY<XXXX <<<

FILE INSPEC
FILE LAST UPDATED: 5 OCT 2009       <20091005/UP>
FILE COVERS 1898 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
    THE ABSTRACT (/AB), BASIC INDEX (/BI) AND TITLE (/TI) FIELDS  >>

FILE COMPENDEX
FILE LAST UPDATED: 5 OCT 2009       <20091005/UP>
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE IN
    THE BASIC INDEX (/BI), ABSTRACT (/AB), and TITLE (/TI) FIELDS  >

<<< Reloaded and enhanced COMPENDEX file is now available
                           - see 'HELP RLOAD' for details <<<

FILE WPIX
FILE LAST UPDATED:          1 OCT 2009   <20091001/UP>
MOST RECENT UPDATE:           200963      <200963/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE
>>> Now containing more than 1.4 million chemical structures in DCR

>>> IPC, ECLA, US National Classifications and Japanese F-Terms
    and FI-Terms have been updated with reclassifications to
    mid-June 2009.
    No update date (UP) has been created for the reclassified
    documents, but they can be identified by
    specific update codes (see HELP CLA for details)<<<

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http://www.stn-international.com/stn_guide.html

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http://scientific.thomsonreuters.com/support/patents/coverage/latest

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http://www.stn-international.com/DWPIAnaVist2_0608.html

>>> HELP for European Patent Classifications see HELP ECLA, HELP ICO

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=> d l115 1-2 bib abs ind
YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTIN
UE? (Y)/N:y
```

L115 ANSWER 1 OF 10 ENERGY COPYRIGHT 2009 USDOE/IEA-ETDE on STN
AN 1988(19):155033 ENERGY Full-text
TI Electrocatalyst and fuel cell electode using the same.
AU Wan, C.-Z. [Canada]
CS Assignee(s): Englehard Corp., USA
PI CA 1219249 17 Mar 1987
v p.
DT Patent
CY Canada
LA English
AB An improved electocatalyst comprises a supported platinum-gallium alloy catalyst of up to 50 atomic percent gallium, preferably of 10 to 30 atomic percent gallium, the balance platinum. The platinum-gallium alloy is supported, preferably on carbon powder or the like and shows greater activity for oxygen reduction and better resistance to sintering than does a comparable platinum catalyst. A fuel cell electrode especially suited for use as a phosphoric acid fuel cell cathode comprises the supported platinum-gallium alloy electrocatalyst bound to an acid resistant support member.
CC *300503; 360101
CT *ELECTROCATALYSTS; *ACID ELECTROLYTE FUEL CELLS: *CATALYTIC EFFECTS; *GALLIUM ALLOYS: *CATALYTIC EFFECTS; *ACID ELECTROLYTE FUEL CELLS: *CATHODES; *ACID ELECTROLYTE FUEL CELLS: *ELECTROCATALYSTS; FABRICATION; PERFORMANCE; PHOSPHORIC ACID; PLATINUM ALLOYS
BT ALLOYS; CATALYSTS; DIRECT ENERGY CONVERTERS; ELECTROCHEMICAL CELLS; ELECTRODES; FUEL CELLS; HYDROGEN COMPOUNDS; INORGANIC ACIDS; PLATINUM METAL ALLOYS

L115 ANSWER 2 OF 10 INSPEC (C) 2009 IET on STN

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AN     1991:3900219  INSPEC     DN  A1991-082360  Full-text
TI     Small cluster effects in WC/Pt thin film catalyst
       deposited by pulsed laser co-ablation method
AU     Ghaisas, S.; Ogale, S.B. (Dept. of Phys., Poona Univ., Pune, India)
SO     Materials Letters (March 1991), vol.10, no.11-12, p. 540-4, 17
       refs.
       CODEN: MLETDJ, ISSN: 0167-577X
       Price: 0167-577X/91/$03.50
DT     Journal
TC     Experimental
CY     Netherlands
LA     English
AN     1991:3900219  INSPEC     DN  A1991-082360  Full-text
AB      A possibility for the synthesis of catalytic electrodes by the
        method of laser co-ablation has been explored. The method has been
        used to obtain small dispersed clusters of platinum in a tungsten
        carbide matrix. The resulting WC/Pt composite thin films have been
        tested for their catalytic activity for H+ reduction in 0.6 N HClO4
        solution. The results indicate that WC/Pt thin film containing small
        clusters of platinum (about 0. 6 atomic percent) are orders of
        magnitude more active than the ones without platinum and the ones
        richer in their platinum content. Low-angle X-ray diffraction (XRD)
        and X-ray photoelectron spectroscopy (XPS) have been employed to
        obtain structural and compositional information about the samples.
        Scanning electron microscopy (SEM) is used to reveal cluster
        morphologies of the films with different platinum contents
AN     1991:3900219  INSPEC     DN  A1991-082360  Full-text
CC     A8265J Heterogeneous catalysis at surfaces and other surface
       reactions; A6855 Thin film growth, structure, and epitaxy; A8115J
       Ion plating and other vapour deposition
CT     catalysts; metal clusters; platinum; scanning electron
       microscope examination of materials; tungsten compounds; vapour
       deposited coatings; X-ray diffraction examination of materials;
       X-ray photoelectron spectra
ST     low angle X-ray diffraction; composition; structure; scanning
       electron microscopy; thin film catalyst; pulsed laser
       co-ablation; synthesis; electrodes; dispersed clusters; composite;
       H+ reduction; X-ray photoelectron spectroscopy; morphologies; HClO4
       solution; WC-Pt
CHI    WCPt ss, Pt ss, C ss, W ss; HClO4 ss, Cl ss, O4 ss, H ss, O ss
ET     Pt; O; Cl; C*W; WC; W cp; cp; C cp; H; H+; H ip 1; ip 1; Cl*H*O;
       HClO4; H cp; Cl cp; O cp


=> d l115 3-5 full
YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTIN
UE? (Y)/N:y
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L115 ANSWER 3 OF 10  WPIX COPYRIGHT 2009      THOMSON REUTERS on STN
AN   2007-359934 [34]   WPIX  Full-text
DNC  C2007-130659 [34]
DNN  N2007-267854 [34]
TI   Production of structure having three-dimensional network skeleton
     useful in fuel cell involves providing film containing first
     material of noble metal that is dispersed in second material; and
     removing the second material by dry etching
DC   A97; L03; X16
IN   DEN T; HORIE R; OKURA H; YASUI N
PA   (CANO-C) CANON KK
CYC  2
PI   US 20070034602  A1 20070215 (200734)* EN  14[6]
     JP 2007044675   A  20070222 (200734)  JA  15
ADT  US 20070034602 A1 US 2006-497391 20060802; JP 2007044675 A JP
     2005-234618 20050812
PRAI JP 2005-234618      20050812
IPCI B01D0069-00 [I,C]; B01D0069-12 [I,A]; B01D0071-00 [I,C]; B01D0071-02
     [I,A]; B01J0023-42 [I,A]; B01J0023-42 [I,C]; B01J0035-00 [I,C];
     B01J0035-04 [I,A]; C03C0025-68 [I,A]; C03C0025-68 [I,C]; H01M0004-86
     [I,A]; H01M0004-86 [I,C]; H01M0004-90 [I,C]; H01M0004-92 [I,A];
     H01M0008-02 [I,A]; H01M0008-02 [I,C]; H01M0008-10 [I,A]; H01M0008-10
     [I,C]
NCL  NCLM  216/058.000
FCL  B01D0069-12; B01D0071-02 500; B01J0023-42 M; B01J0035-04 331 A;
     H01M0004-86 M; H01M0004-92; H01M0008-02 E; H01M0008-10
FTRM 4D006; 4G069; 4G169; 5H018; 5H026; 4G169/AA02; 5H018/AA06;
     5H026/AA06; 5H018/BB01; 5H026/BB01; 4G169/BB02.A; 4G169/BB02.B;
     5H026/BB06; 5H018/BB07; 5H026/BB10; 5H018/BB11; 5H018/BB12;
     5H018/BB16; 4G169/BC72.A; 4G169/BC75.A; 4G169/BC75.B; 4G169/CC32;
     5H026/CX04; 4G169/EB11; 4G169/EB19; 4G169/EC27; 5H018/EE02;
     5H026/EE02; 5H018/EE03; 5H026/EE11; 5H018/EE17; 5H026/EE18;
     4D006/GA41; 5H018/HH03; 5H026/HH03; 5H018/HH04; 5H026/HH04;
     5H018/HH05; 5H026/HH05; 4D006/MA06; 4D006/MA28; 4D006/MB01;
     4D006/MC02; 4D006/MC28; 4D006/MC30; 4D006/MC72; 4D006/MC73;
     4D006/MC74; 4D006/NA33; 4D006/NA46; 4D006/NA50; 4D006/NA64;
     4D006/PA01; 4D006/PB18; 4D006/PB66; 4D006/PC80
AB    US 20070034602 A1   UPAB: 20070529
      NOVELTY - Production of a structure having a three-dimensional
      network skeleton involves providing a film containing a first
      material and a second material, where the first material contains a
      noble metal and is dispersed in the second material; and removing the
      second material contained in the film by dry etching.
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DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) a structure having a three-dimensional network skeleton composed of a material including a noble metal, the maximum diameter of a transverse section of the skeleton is less than or equal to 100 nm;

(2) a membrane electrode assembly for a fuel cell comprising a solid polymer electrolyte, and a catalyst layer comprising the structure; and

(3) a fuel cell comprising the membrane electrode assembly, an anodic fuel diffusion layer, a cathodic fuel diffusion layer, an anodic collector, and a cathodic collector, where the membrane electrode assembly is disposed between the anodic fuel diffusion layer and the cathodic fuel diffusion layer, and the anodic fuel diffusion layer and the cathodic fuel diffusion layer are disposed between the anodic collector and the cathodic collector.

USE - For production of a structure having a three-dimensional network skeleton useful in membrane electrode assembly for fuel cell (claimed); and also useful for a small mobile device, e.g. mobile phone, notebook computer or digital video camera, to an automotive fuel cell, residential fuel cell and small industrial fuel cell.

ADVANTAGE - The process allows the stable production of the structure. The membrane electrode obtained from the structure has high power-generation efficiency.

TECH ELECTRONICS - Preferred Cell: In the fuel cell, the catalyst layer is disposed between the solid polymer electrolyte and one of the anodic fuel diffusion layer and the cathodic fuel diffusion layer.

INORGANIC CHEMISTRY - Preferred Method: The amount of the first material in the film is 5 - 40 (preferably 5 - 20) atomic percent of the total amount of the first material and the second material. The dry etching is nonplasma etching using a fluorine-based reactant gas. Preferred Components: The first material is platinum or palladium and the second material is silicon. Preferred Structure: The maximum diameter of the transverse section of the skeleton is less than or equal to 20 nm. The porosity of the structure is 30 - 95 (preferably 60 - 95)%. In the structure, the material forming the skeleton is a noble metal of platinum or palladium, an alloy containing platinum or palladium, or a silicide of platinum or palladium. In the assembly, the catalyst layer additionally comprises fine particles formed of a substance that functions as a catalyst or as a promoter for enhancing catalytic activity of the fuel cell; and an electron transferring material as a carrier.

ABEX EXAMPLE - A four-inch (101.6 mm) copper target was used on a backing plate. Sputtering was performed with a radio frequency (RF) power supply at an argon (Ar) flow rate of 50 sccm, a discharge

pressure of 0.7 Pa, and an input power of 300 W. The substrate temperature was room temperature. A thin copper film having a thickness of 50 nm was formed on silicon (Si) wafer. Subsequently, a platinum-silicon composite film having a thickness of 100 nm was formed on the copper film on the Si wafer by RF magnetron sputtering. A four-inch (101.6 mm) silicon target including five pieces of platinum chips on it was used on a backing plate. Sputtering was performed with a RF power supply at an Ar flow rate of 19 sccm, a discharge pressure of 0.11 Pa, and an input power of 120 W. The substrate temperature was room temperature to obtain platinum-silicon composite film (containing 30 atomic percent of platinum) with filed emission scanning electron microscope (FE-SEM). Then, the platinum-silicon composite film was fixed to a four-inch (101.6 mm) silicon wafer with a Kapton (RTM: tape). The silicon wafer was placed on a turntable of a XeF2 dry etching apparatus. The platinum-silicon composite film was irradiated with one pulse of a XeF2 molecular flow at the diffusive pressure of a XeF2 diffusion container of 60 Pa. Silicon in the composite film was selectively etched away to provide a platinum three-dimensional network structure. The FE-SEM observation of the film after the XeF2 dry etching showed that the film had a platinum three-dimensional network skeleton having a porosity of 65% and an average diameter of about 5 nm and extending in the thickness direction. The film was dipped into aqueous nitric acid to dissolve copper, to isolate a platinum three-dimensional network nano-structure having a thickness of 100 nm and including a skeleton having a maximum diameter of 5 nm.

FS CPI; EPI
MC CPI: A12-E06B; L03-E04B
EPI: X16-E06A5C

L115 ANSWER 4 OF 10 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
AN 2006-221276 [23] WPIX Full-text
DNC C2006-072675 [23]
DNN N2006-190081 [23]
TI Catalyst composition for use as catalyst in fuel cell electrodes comprises platinum, copper and nickel in total concentration of greater than ninety-five atomic percent
DC L03; X16
IN CENDAK K J; CHONDROUDIS K; DEVENNEY M; FAN Q; GIAQUINTA D M; GORER A; OYANAGI H; STRASSER P; URATA K
PA (HOND-C) HONDA GIKEN KOGYO KK; (SYMY-N) SYMYX TECHNOLOGIES INC
CYC 1
PI US 20060058185 A1 20060316 (200623)* EN 31[4]
ADT US 20060058185 A1 Provisional US 2004-602459P 20040818; US 20060058185 A1 US 2005-205557 20050817

PRAI US 2005-205557 20050817
US 2004-602459P 20040818
IPCI C22C0005-00 [I,C]; C22C0005-04 [I,A]
EPC B01J0019-00C; B01J0023-89F; B01J0037-34; C22C0005-04; C22C0009-00; C22C0009-06; C22C0030-00; C40B0030-08; C40B0040-18; C40B0050-18; H01M0004-92B
ICO L01J0219:00C10D2; L01J0219:00C2D24B; L01J0219:00C2D24D; L01J0219:00C4L12; L01J0219:00C4L6; L01J0219:00C6J; L01J0219:00C6P; T01M0004:92S
NCL NCLM 502/326.000
NCLS 420/468.000
AB US 20060058185 A1 UPAB: 20060405

NOVELTY - A catalyst composition comprises platinum, copper and nickel. The sum of the concentrations of platinum, copper and nickel is greater than 95 atomic percent. The concentration of platinum is 5-80 atomic percent .

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method for preparing a catalyst composition from a catalyst precursor composition, comprising subjecting the precursor composition to conditions sufficient to remove a present portion of the copper or nickel, such that the resulting catalyst composition comprises platinum, copper and nickel, the sum of the concentrations of platinum, copper and nickel is greater than 95 atomic percent, and the concentration of platinum is greater than 55 atomic percent.

USE - For use as catalyst in fuel cell electrodes.

ADVANTAGE - The composition exhibits favorable electrocatalytic activity while having reduced amounts of platinum, as compared to a platinum standard.

DESCRIPTION OF DRAWINGS - The drawing shows a cross-sectional view of the assembled fuel cell.

Fuel cell (20)
Exchange membrane (21)
Anode (22)
Cathode (23)
Current collects (24, 25)
Sealants (26, 27)
Fuel chamber (28)
Air chamber (29)

TECH INORGANIC CHEMISTRY - Preferred Composition: The composition consists of platinum, copper and nickel, where platinum, copper or nickel is in the metallic oxidation state. The composition comprises 55-75 (preferably greater than 60) at.% platinum, 20-45 (preferably 25-35) at.% copper, and 1-15 (preferably 1-25) at.% nickel. The composition has an observed lattice constant that is less than a lattice constant as calculated in accordance with Vegard's Law.
Preferred Method: The catalyst precursor composition is contacted with an acidic solution to solubilize a portion of the

copper or nickel present. It subjected to an electrochemical reaction where a hydrogen-containing fuel and oxygen are converted to reaction products and electricity in a fuel cell comprising anode, proton exchange membrane, cathode, catalyst precursor composition, and electrically conductive external circuit connecting the anode and cathode, the method comprising contacting the hydrogen-containing fuel or the oxygen and the catalyst precursor composition to oxidize the hydrogen-containing fuel or catalytically reduce the oxygen, and to dissolved in situ from the catalyst precursor composition copper or nickel.

FS CPI; EPI
MC CPI: L03-E04A2; L03-E04B1
EPI: X16-C01C; X16-E06A5A

L115 ANSWER 5 OF 10 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN
AN 2005-416391 [42] WPIX Full-text
CR 2005-240600; 2006-576884
DNC C2005-127398 [42]
DNN N2005-337776 [42]
TI Catalyst composition for use in fuel cells for e.g. electric vehicles, computers, cell phones, comprises conductive fibers bearing nanoparticles
DC A85; L02; L03; M26; P42; X16
IN DONG Y; LI Y; LI Y Q; WANG N
PA (INTE-N) INTEMATIX CORP
CYC 108
PI US 20050112450 A1 20050526 (200542)* EN 30[14]
WO 2005084399 A2 20050915 (200561) EN
EP 1754234 A2 20070221 (200717) EN
CN 1954392 A 20070425 (200759) ZH
JP 2007526616 W 20070913 (200762) JA 33
KR 2007046784 A 20070503 (200803) KO
ADT US 20050112450 A1 Provisional US 2003-501158P 20030908; US 20050112450 A1 Provisional US 2004-549712P 20040302; US 20050112450 A1 CIP of US 2004-823088 20040412; US 20050112450 A1 US 2004-898669 20040723; CN 1954392 A CN 2005-80011129 20050302; EP 1754234 A2 EP 2005-730186 20050302; WO 2005084399 A2 WO 2005-US7343 20050302; EP 1754234 A2 WO 2005-US7343 20050302; JP 2007526616 W WO 2005-US7343 20050302; JP 2007526616 W JP 2007-502081 20050302; KR 2007046784 A WO 2005-US7343 20050302; KR 2007046784 A KR 2006-720287 20060929
FDT EP 1754234 A2 Based on WO 2005084399 A; JP 2007526616 W Based on WO 2005084399 A; KR 2007046784 A Based on WO 2005084399 A
PRAI US 2004-898669 20040723
US 2003-501158P 20030908
US 2004-549712P 20040302
US 2004-823088 20040412

IC ICM H01M
IPCI C01B0031-00 [I,A]; C01B0031-00 [I,C]; C01B0031-00 [I,C]; H01B0001-04 [I,A]; H01B0001-04 [I,C]; H01B0001-04 [I,C]; H01M0004-86 [I,A]; H01M0004-86 [I,C]; H01M0004-88 [I,A]; H01M0004-88 [I,C]; H01M0004-90 [I,A]; H01M0004-90 [I,A]; H01M0004-90 [I,C]; H01M0004-90 [I,C]; H01M0004-96 [I,A]; H01M0004-96 [I,C]; H01M0008-02 [I,A]; H01M0008-02 [I,C]; H01M0008-10 [I,A]; H01M0008-10 [I,C]
IPCR B01J0021-00 [I,C]; B01J0021-18 [I,A]; B01J0023-42 [I,A]; B01J0023-42 [I,C]; B05D0005-12 [I,A]; B05D0005-12 [I,C]; H01B0001-00 [I,A]; H01B0001-00 [I,C]; H01B0001-04 [I,A]; H01B0001-04 [I,C]; H01M0004-88 [I,A]; H01M0004-88 [I,C]; H01M0004-90 [I,A]; H01M0004-90 [I,C]; H01M0004-92 [I,A]; H01M0004-96 [I,A]; H01M0004-96 [I,C]; H01M0008-10 [I,A]; H01M0008-10 [I,C]
NCL NCLM 429/044.000
NCLS 252/500.000; 252/502.000; 252/503.000
FCL H01M0004-88 K; H01M0004-90 M; H01M0004-90 X; H01M0004-96 B; H01M0008-02 P; H01M0008-10
Main: H01M0004-96 B
Secondary: H01M0004-88 K; H01M0004-90 M; H01M0004-90 X; H01M0008-02 P; H01M0008-10
FTRM 5H018; 5H026; 5H018/AA06; 5H026/AA06; 5H018/AS01; 5H018/BB07; 5H026/EE19; 5H018/HH01
AB US 20050112450 A1 UPAB: 20090928

NOVELTY - A catalyst composition comprises conductive fibers bearing nanoparticles.

USE - For use in fuel cells, e.g. polymer electrolyte membrane (PEM) fuel cells for e.g. electric vehicles, computers, cell phones, other electronic devices, home electrical power generation systems.

ADVANTAGE - The carbon nanotubes deposited on the carbon fiber papers enhance the catalyst surface area and provide a micro gas-diffusion structure.

DESCRIPTION OF DRAWINGS - The figure shows a schematic of a detailed structure of catalyst thin-film/carbon nanotubes layer/carbon fiber-sheet.

TECH CERAMICS AND GLASS - Preferred Materials: The conductive fibers are carbon fibers or a porous metal sheet. The carbon fibers comprise a porous electrode, a carbon paper or a carbon cloth. The nanoparticles are nanotubes, nanofibers, nanohorns, nanopowders, nanospheres, or quantum dots. The nanotubes have a length less than 50 microns and a diameter 1 nm to less than 100 nm.
METALLURGY - Preferred Materials: The carbon nanotubes are seeded with catalyst(s) comprising cobalt (Co), nickel (Ni), vanadium (V), chromium (Cr), platinum (Pt), ruthenium (Ru), molybdenum (Mo), tungsten (W), tantalum (Ta), and/or zirconium (Zr). The catalyst may be iron nickel cobalt FexNiyCo1-x-y (x, y=0-1), cobalt molybdenum Co1-xMox (x=0-0.3), cobalt nickel molybdenum Co1-x-yNixMoy (x=0.1-0.7; y=0-0.3), cobalt nickel

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     vanadium chromium Co1-x-y-zNixVyCrz (x=0-0.7; y, z=0-0.2), nickel
     molybdenum aluminum Ni1-x-yMoxAly (x, y=0-0.2), or cobalt nickel
     aluminum Co1-x-yNi+xAly (x=0-0.7; y=0-0.2). The catalyst
     may be Co8.8Mo1.2, Co2.2Ni5.6Mo2.2, Co5.7Ni2.1, V1.1Cr1.1,
     Ni8.0Mo1.0Al1.0, or Co6.4Ni2.4Al1.2. The nanoparticles are coated
     with a 1-1000 (preferably 5-500) Angstrom continuous thin film
     comprising a platinum alloy and at least partially covering the
     nanoparticles. Alternatively, the nanoparticles are coated with a
     non-continuous thin film comprising a platinum alloy. The thin film
     comprises 5-100 Angstrom thick islands in an area of 1-104 nm2. The
     thin film comprises an alloy comprising platinum (Pt), V and Co, Ni,
     Mo, Ta, W, and/or Zr. The alloy comprises up to 50% (preferably up
     to 12%) mole ratio or atomic percentage
     platinum. The alloy may have the formula PtxVyCozNiw.
     x=greater than 0.06 and less than 1 (preferably 0.12);
     y=greater than 0 and less than 1 (preferably 0.07);
     z=greater than 0 and less than 1 (preferably 0.56);
     w=greater than 0 and less than 1 (preferably 0.25);
     x+y+z+w=1.
     POLYMERS - Preferred Materials: The carbon fibers comprise a
     carbon-impregnated polymer.
FS   CPI; GMPI; EPI
MC   CPI: L03-A02B; L03-E04A2; L03-E04B; M26-B
     EPI: X16-C01C; X16-E06A1A; X16-E06A5A


=> d l115 6-10 bib abs hitind
YOU HAVE REQUESTED DATA FROM FILE 'ENERGY, INSPEC, WPIX, HCAPLUS' - CONTIN
UE? (Y)/N:y



L115 ANSWER 6 OF 10  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN   2008:1241230  HCAPLUS  Full-text
DN   149:451842
TI   Platinum, tungsten, and nickel or zirconium containing
     electrocatalysts
IN   He, Ting; Kreidler, Eric Rolland
PA   Honda Motor Co., Ltd., Japan
SO   U.S., 6pp.
     CODEN: USXXAM
DT   Patent
LA   English
FAN.CNT 2
     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
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PI   US 7435504           B2    20081014   US 2005-210761
                                                                200508
                                                                25
     US 20070049490       A1    20070301
     WO 2007024489        A2    20070301   WO 2006-US31097
                                                                200608
                                                                09
     WO 2007024489        A3    20070412
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
             CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
             GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG,
             KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA,
             MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH,
             PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM,
             TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
         RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
             IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
             TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
             ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA
     JP 2009506500        T     20090212   JP 2008-527961
                                                                200608
                                                                09
     US 20090023051       A1    20090122   US 2008-238968
                                                                200809
                                                                26
PRAI US 2005-210761       A     20050825
     WO 2006-US31097      W     20060809
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB   The present teachings are directed toward electrocatalyst compns. of
     alloys of platinum, tungsten and one of either of nickel or zirconium
     for use in fuel cells.  The alloys consist essentially of platinum
     present in an atomic percentage ranging between about 20% and about
     45%, tungsten present in an atomic percentage ranging between about
     30% and about 70%, and one of either nickel present in an atomic
     percentage ranging between about 5% and about 25%, or zirconium
     present in an atomic percentage ranging between about 5% and about
     40%.
INCL 429044000; 502308000; 502313000; 502315000; 420432000; 420580000
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 56, 67
IT   Catalysts
        (electrocatalysts; platinum, tungsten, and nickel or zirconium
        containing electrocatalysts for fuel cells)
RE.CNT  38    THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT
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L115 ANSWER 7 OF 10  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN   2007:228229  HCAPLUS  Full-text
DN   146:299222
TI   Platinum, tungsten, and nickel or zirconium containing
     electrocatalysts
IN   He, Ting; Kreidler, Eric Rolland
PA   Honda Motor Co., Ltd., Japan
SO   PCT Int. Appl., 20 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
FAN.CNT 2
     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------
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PI   WO 2007024489        A2    20070301   WO 2006-US31097
                                                                  200608
                                                                  09
     WO 2007024489        A3    20070412
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,
             CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
             GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG,
             KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA,
             MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH,
             PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM,
             TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
         RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
             IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
             TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
             ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA
     US 7435504           B2    20081014   US 2005-210761
                                                                  200508
                                                                  25
     US 20070049490       A1    20070301
     JP 2009506500        T     20090212   JP 2008-527961
                                                                  200608
                                                                  09
PRAI US 2005-210761       A     20050825
     WO 2006-US31097      W     20060809
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB   The present teachings are directed toward electrocatalyst compns. of
     alloys of platinum, tungsten and one of either of nickel or zirconium
     for use in fuel cells.  The alloys consist essentially of platinum
     present in an atomic percentage ranging between about 20% and about
     45%, tungsten present in an atomic percentage ranging between about
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30% and about 70%, and one of either nickel present in an atomic percentage ranging between about 5% and about 25%, or zirconium present in an atomic percentage ranging between about 5% and about 40%.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

IT Catalysts
(electrocatalysts; platinum, tungsten, and nickel or zirconium containing electrocatalysts for fuel cells)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L115 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2007:758490 HCAPLUS Full-text
DN 147:169700
TI Platinum and titanium containing electrocatalysts
IN He, Ting; Kreidler, Eric Rolland
PA Honda Motor Co., Ltd., Japan
SO U.S. Pat. Appl. Publ., 13pp., Cont.-in-part of U.S. Ser. No. 370,991.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20070160897	A1	20070712	US 2006-429251	20060508
	US 7318977	B2	20080115		
	US 20070160895	A1	20070712	US 2006-326350	20060106
	US 20070212590	A1	20070913	US 2006-370991	20060309
	WO 2007081774	A2	20070719	WO 2007-US225	20070105
	WO 2007081774	A3	20070913		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV,

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             SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM,
             ZW
         RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,
             IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD,
             TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
             ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA
     JP 2009522100         T      20090611    JP 2008-549565
                                                                   200701
                                                                   05
PRAI US 2006-326350        A2     20060106
     US 2006-370991        A2     20060309
     US 2006-429251        A      20060508
     US 2006-429252        A      20060508
     WO 2007-US225         W      20070105
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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present teachings are directed toward electrocatalyst compns. of platinum, titanium, a third, fourth and possibly fifth metal for use in fuel cells. The electrocatalyst composition is composed essentially of platinum present in an atomic percentage ranging between about 30% and about 85%, titanium present in an atomic percentage ranging between about 5% and about 30%, a third metal present in an atomic percentage ranging between about 1% and about 30%, a fourth metal present in an atomic percentage ranging between about 1% and about 30%, and a possible fifth metal present in an atomic percentage ranging between about 1% and about 30%. The third metal can be at least one member selected from the group consisting of nickel, vanadium, molybdenum, copper, manganese, iron, cobalt, ruthenium, rhodium, palladium, silver, osmium, iridium and gold. The fourth and fifth metals are different from the third metal and each other and can be selected from the group consisting of scandium, vanadium, chromium, manganese, iron, nickel, copper, zinc, yttrium, zirconium, niobium, molybdenum, cadmium, tin, hafnium, tantalum and rhenium.

INCL 429040000; 502339000; 502326000; 502330000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

IT Catalysts
(electrocatalysts; platinum and titanium containing electrocatalysts)

OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L115 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2006:545013 HCAPLUS Full-text

DN 145:11419
TI Platinum and tungsten containing electrocatalysts for use in fuel cells
IN He, Ting; Kreidler, Eric Rolland; Nomura, Tadashi; Minor, Lara
PA USA
SO U.S. Pat. Appl. Publ., 7 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20060121332	A1	20060608	US 2004-4235	20041206
	WO 2006062954	A1	20060615	WO 2005-US44080	20051205

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

	US 20060141335	A1	20060629	US 2005-294465	20051206
PRAI	US 2004-4235	A	20041206		

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present teachings are directed toward electrocatalyst composition of an alloy of platinum and tungsten for use in fuel cells. The alloy consists essentially of platinum metal present in an atomic percentage ranging between about 20% and about 50%, and tungsten metal present in an atomic percentage ranging between about 50% and about 80%.

INCL 429040000; 429044000; 502339000; 420466000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67
IT Catalysts
(electrocatalysts; platinum and tungsten containing

electrocatalysts
for use in fuel cells)

L115 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 1992:600438 HCAPLUS Full-text
DN 117:200438
OREF 117:34445a,34448a
TI Catalytic influence of commercial ruthenium, rhodium, platinum, and palladium (.apprx.0, 1 atomic percent) intercalated in graphite on the hydrogen evolution reaction
AU Fournier, Joel; Wrona, Piotr K.; Lasia, Andrzej; Lacasse, Robert; Lalancette, Jean Marc; Menard, Hugues
CS Dep. Chim., Univ. Sherbrooke, Sherbrooke, QC, J1K 2R1, Can.
SO Journal of the Electrochemical Society (1992), 139(9), 2372-8
CODEN: JESOAN; ISSN: 0013-4651
DT Journal
LA English
AB Graphite electrodes intercalated with various metals (Ni, Co, Pd, Pt, Rh, and Ru) have been bonded with an inorg. polymer LaPO4 and used as cathodes in the hydrogen evoln. reactions (HER) in 1M KOH. Four of the most active electrodes showed very good mech. and electrochem. stability. The overvoltage of the HER at 0.10 A cm-2 decreased in the following order: -525 mV, for pure graphite and -254, -137, -103, and -58 mV, for the Pd/C, Rh/C, Pt/C, and Ru/C electrodes, resp. The kinetics of the HER for two electrodes (Ru/C and Pd/C) were measured with the use of an a.c. impedance technique. In both cases, the HER proceeds via the Volmer-Heyrovsky mechanism. The results obtained proved that the Pd/C electrode had a larger active surface area than the Ru/C one did.
CC 72-2 (Electrochemistry)
Section cross-reference(s): 67, 78
IT Reduction catalysts
(electrochem., graphite-platinum metal intercalated compds., for hydrogen evolution)
OSC.G 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS RECORD (11 CITINGS)

=> d l122 1-12 bib abs hitstr hitind

L122 ANSWER 1 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2009:556178 HCAPLUS Full-text
DN 150:499033
TI Method for manufacturing alloyed platinum nanoparticle catalysts by freeze-drying of metal precursors
IN Strasser, Peter; Koh, Shirlaine; Mani, Prasanna; Ratndeep,

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     Srivastava
PA   University of Houston, USA
SO   U.S. Pat. Appl. Publ., 19pp.
     CODEN: USXXCO
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------
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PI   US 20090114061       A1    20090507    US 2008-206587
                                                                   200809
                                                                   08
PRAI US 2007-970851P      P     20070907
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB    A method of producing de-alloyed nanoparticles, e.g., Pt75Cu25.  In
      an embodiment, the method comprises admixing metal precursors,
      freeze-drying, annealing, and de-alloying the nanoparticles in situ.
      Further, in an embodiment de-alloyed nanoparticle formed by the
      method, wherein the nanoparticle further comprises a core-shell
      arrangement.  The nanoparticle is suitable for electrocatalytic
      processes and devices.  At least one precursor suspension comprises
      at least one metal chosen from gold, silver, nickel, palladium,
      chromium, molybdenum, manganese, titanium, scandium, tungsten,
      vanadium, and alloys thereof.  Freeze-drying further comprises
      applying a vacuum at a temperature of at least about -100°.  The
      catalyst particles in acid comprises soaking in an acid chosen from
      acetic acid, hydrochloric acid, nitric acid, sulfuric acid,
      perchloric acid, hydrobromic acid, hydroiodic acid, and combinations
      thereof.
INCL 075255000; 502340000; 502344000; 502325000; 502300000; 502319000;
     502321000; 502324000; 502350000; 502355000
CC   56-4 (Nonferrous Metals and Alloys)
     Section cross-reference(s): 67, 72
ST   platinum nanoparticle catalyst freeze drying annealing
     precursor electrochem
IT   Electrochemistry
     Freeze drying
     Nanoparticles
        (method for manufacturing alloyed platinum nanoparticle
        catalysts by freeze-drying of metal precursors)
IT   Catalysts
        (platinum nanoparticles; method for manufacturing alloyed platinum
        nanoparticle catalysts by freeze-drying of metal
        precursors)
IT   Electrodes
        (rotating disk electrodes; method for manufacturing alloyed
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platinum
        nanoparticle catalysts by freeze-drying of metal
        precursors)
IT   942228-50-4, Nafion NRE 212
     RL: NUU (Other use, unclassified); USES (Uses)
        (dispersion cast membrane; method for manufacturing alloyed
platinum
        nanoparticle catalysts by freeze-drying of metal
        precursors)
IT   7601-90-3, Perchloric acid, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (electrolyte; method for manufacturing alloyed platinum
nanoparticle
        catalysts by freeze-drying of metal precursors)
IT   7664-93-9, Sulfuric acid, reactions
     RL: RCT (Reactant); RGT (Reagent); RACT (Reactant or reagent)
        (ion exchange agent; method for manufacturing alloyed platinum
        nanoparticle catalysts by freeze-drying of metal
        precursors)
IT   7440-06-4, Platinum, processes   39314-70-0, Copper 50, platinum 50
     (atomic)   39328-94-4, Copper 75, platinum 25 (
     atomic)   64800-65-3, Copper 25, platinum 75 (atomic)
     RL: CAT (Catalyst use); NANO (Nanomaterial); PEP (Physical,
     engineering or chemical process); PROC (Process); USES (Uses)
        (method for manufacturing alloyed platinum nanoparticle
        catalysts by freeze-drying of metal precursors)
IT   64-19-7, Acetic acid, reactions   7647-01-0, Hydrochloric acid,
     reactions   7697-37-2, Nitric acid, reactions   10034-85-2,
     Hydriodic acid   10035-10-6, Hydrobromic acid, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (method for manufacturing alloyed platinum nanoparticle
        catalysts by freeze-drying of metal precursors)
IT   82534-00-7, Cobalt 75, platinum 25 (
     atomic)   1005456-14-3   1005456-15-4   1005456-16-5
     RL: NANO (Nanomaterial); PEP (Physical, engineering or chemical
     process); PROC (Process)
        (nanoparticles; method for manufacturing alloyed platinum
nanoparticle
        catalysts by freeze-drying of metal precursors)
IT   7439-96-5, Manganese, uses   7439-98-7, Molybdenum, uses
     7440-02-0, Nickel, uses   7440-05-3, Palladium, uses
     7440-20-2, Scandium, uses   7440-22-4, Silver, uses   7440-32-6,
     Titanium, uses   7440-33-7, Tungsten, uses   7440-47-3,
     Chromium, uses   7440-57-5, Gold, uses   7440-62-2,
     Vanadium, uses
     RL: TEM (Technical or engineered material use); USES (Uses)
        (platinum alloy component; method for manufacturing alloyed
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platinum
        nanoparticle catalysts by freeze-drying of metal
        precursors)
IT   1333-74-0, Hydrogen, reactions
     RL: RGT (Reagent); RACT (Reactant or reagent)
        (reversible hydrogen electrode; method for manufacturing alloyed
        platinum nanoparticle catalysts by freeze-drying of
        metal precursors)
IT   7440-44-0, Carbon, uses
     RL: TEM (Technical or engineered material use); USES (Uses)
        (substrate; method for manufacturing alloyed platinum nanoparticle
        catalysts by freeze-drying of metal precursors)

L122 ANSWER 2 OF 12  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN   2009:456857  HCAPLUS  Full-text
DN   150:452243
TI   De-alloyed membrane electrode assemblies for fuel cells
IN   Strasser, Peter; Mani, Prasanna; Srivastava, Ratndeep
PA   University of Houston System, USA
SO   U.S. Pat. Appl. Publ., 20pp.
     CODEN: USXXCO
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND   DATE       APPLICATION NO.        DATE
     ---------------     ----   --------   --------------------
     --------
PI   US 20090098420       A1    20090416   US 2008-250992
                                                                  200810
                                                                  14
PRAI US 2007-979704P      P     20071012
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB    A method for membrane electrode assembly (MEA) fabrication for fuel
      cells using de-alloyed nanoparticle membranes as electrodes is
      presented.  This method for fabrication of a fuel cell electrode
      assembly, comprises: preparing a catalyst coated membrane, forming a
      membrane electrode assembly, assembling a fuel cell, and de-alloying
      the membrane electrode assembly.  Further described is a fuel cell
      comprising a de-alloyed catalyst and a cathode comprising, a 1st
      membrane electrode assembly, wherein the de-alloyed catalyst is
      coated on the membrane electrode assembly.
INCL 429013000; 427077000; 427078000; 429040000
CC   52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
     Section cross-reference(s): 56
IT   Chromium alloy, base
     Gold alloy, base
     Manganese alloy, base
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     Molybdenum alloy, base
     Nickel alloy, base
     Palladium alloy, base
     Scandium alloy, base
     Silver alloy, base
     Titanium alloy, base
     Tungsten alloy, base
     Vanadium alloy, base
     RL: CAT (Catalyst use); TEM (Technical or engineered material use);
     USES (Uses)
        (de-alloyed membrane-electrode assemblies for fuel cells)
IT   7439-96-5, Manganese, uses   7439-98-7, Molybdenum, uses
     7440-02-0, Nickel, uses   7440-05-3, Palladium, uses
     7440-06-4, Platinum, uses   7440-20-2, Scandium, uses   7440-22-4,
     Silver, uses   7440-32-6, Titanium, uses   7440-33-7, Tungsten, uses
     7440-44-0, Carbon, uses   7440-47-3, Chromium, uses
     7440-50-8, Copper, uses   7440-57-5, Gold, uses   7440-62-2,
     Vanadium, uses   51880-67-2, Copper 39, platinum 61 (atomic)
     934423-68-4, Copper 18, platinum 82 (atomic)
     RL: CAT (Catalyst use); TEM (Technical or engineered material use);
     USES (Uses)
        (de-alloyed membrane-electrode assemblies for fuel cells)
IT   39328-94-4, Copper 75, platinum 25 (
     atomic)
     RL: CAT (Catalyst use); NANO (Nanomaterial); TEM (Technical or
     engineered material use); USES (Uses)
        (nanoparticles, de-alloyed; de-alloyed membrane-electrode
        assemblies for fuel cells)

L122 ANSWER 3 OF 12  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN   2008:1477126  HCAPLUS  Full-text
DN   150:22278
TI   Fabrication of long metal nanowires for use as catalysts
     in proton exchange membrane fuel cells
IN   Shui, Jianglan; Li, James C. M.
PA   University of Rochester, USA
SO   U.S. Pat. Appl. Publ., 19pp.
     CODEN: USXXCO
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND   DATE       APPLICATION NO.          DATE
     ---------------     ----   --------   --------------------
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PI   US 20080305377       A1    20081211   US 2008-49723
                                                                    200803
                                                                    17
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PRAI US 2007-895043P P 20070315
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT
AB Metallic nanofiber (nanowire) structures for use in fabrication of fuel cells are manufactured by: (1) providing a first solution containing a first material and a second material that includes at least one metal, (2) forming the first solution into composite fibers (containing the first and second materials), and (3) removing the first material from the composite fibers to produce a metallic nanofiber. The first material is a polymer that can be removed by pyrolysis in the final step. The metallic nanofiber structures can be used as fuel cell catalysts.
INCL 429030000; 264433000; 428397000; 429044000; 425174800E
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST long metallic nanowire proton exchange membrane fuel cell; nanofiber nanoparticle carbon fiber nanotube alloy fuel cell; metal organometallic salt fuel cell catalyst
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Denka Black, Ketjen Black, and acetylene black, carbon-based material; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Carbon fibers, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(E-TEK; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Carbon black, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(Vulcan XC 72; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Nanofibers
(carbon and metallic; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Nanotubes
(carbon; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Nanoparticles
(fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Polyoxyalkylenes, uses
RL: REM (Removal or disposal); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)

(fabrication of long metal nanowires for use as catalysts
in proton exchange membrane fuel cells)
IT Polyoxyalkylenes, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use);
USES (Uses)
(fluorine- and sulfo-containing, ionomers, membrane; fabrication
of
long metal nanowires for use as catalysts in proton
exchange membrane fuel cells)
IT Ionomers
RL: TEM (Technical or engineered material use); USES (Uses)
(membranes; fabrication of long metal nanowires for use as
catalysts in proton exchange membrane fuel cells)
IT Nanotubes
(metal; fabrication of long metal nanowires for use as
catalysts in proton exchange membrane fuel cells)
IT Alloys, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use);
USES (Uses)
(nanofibers; fabrication of long metal nanowires for use as
catalysts in proton exchange membrane fuel cells)
IT Fluoropolymers, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use);
USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers, membrane;
fabrication
of long metal nanowires for use as catalysts in proton
exchange membrane fuel cells)
IT Ionomers
RL: CAT (Catalyst use); TEM (Technical or engineered material use);
USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing, membrane;
fabrication of long metal nanowires for use as catalysts
in proton exchange membrane fuel cells)
IT Fuel cells
(proton exchange membrane; fabrication of long metal nanowires
for use as catalysts in proton exchange membrane fuel
cells)
IT 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(carbon-based material; fabrication of long metal nanowires for
use as catalysts in proton exchange membrane fuel
cells)
IT 10025-73-7, Chromium chloride ($CrCl_3$)
RL: RGT (Reagent); RACT (Reactant or reagent)
(chromium source; fabrication of long metal nanowires
for use as catalysts in proton exchange membrane fuel

cells)
IT 9002-84-0, PTFE
RL: TEM (Technical or engineered material use); USES (Uses)
(coating material; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 10141-05-6, Cobalt nitrate (Co(NO3)2)
RL: RGT (Reagent); RACT (Reactant or reagent)
(cobalt source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 7447-39-4, Copper chloride (CuCl2), reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(copper source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 16903-35-8, Tetrachloroauric acid
RL: RGT (Reagent); RACT (Reactant or reagent)
(gold source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 7758-94-3, Iron chloride (FeCl2)
RL: RGT (Reagent); RACT (Reactant or reagent)
(iron source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 7440-50-8, Copper, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(microwire; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 13478-18-7, Molybdenum chloride (MoCl3)
RL: RGT (Reagent); RACT (Reactant or reagent)
(molybdenum source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-33-7, Tungsten, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-55-3, Gallium, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 53886-70-7, Nickel 75, platinum 25(atomic)
RL: CAT (Catalyst use); TEM (Technical or engineered material use); NANO (Nanomaterial); USES (Uses)
(nanofibers; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); NANO (Nanomaterial);

USES (Uses)
(nanotubes; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 11107-69-0 11134-15-9 12623-53-9 12667-08-2 12779-05-4 39339-47-4 50942-39-7 51402-57-4 60501-15-7 91810-23-0 271596-25-9 887768-92-5 887768-93-6 1091604-86-2 1091604-87-3
RL: TEM (Technical or engineered material use); NANO (Nanomaterial); USES (Uses)
(nanowires; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7718-54-9, Nickel chloride (NiCl2), reactions
13138-45-9, Nickel nitrate
RL: RGT (Reagent); RACT (Reactant or reagent)
(nickel source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7647-10-1, Palladium chloride (PdCl2)
RL: RGT (Reagent); RACT (Reactant or reagent)
(palladium source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 15170-57-7, Platinum bisacetylacetonate 18497-13-7, Chloroplatinic acid hexahydrate 421550-00-7
RL: RGT (Reagent); RACT (Reactant or reagent)
(platinum source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 9002-89-5, Polyvinyl alcohol 9003-20-7, Polyvinyl acetate 9003-39-8, Poly(vinyl pyrrolidone) 24937-79-9, Poly(vinylidene fluoride) 25322-68-3, Poly(ethylene oxide)
RL: REM (Removal or disposal); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(pyrolytic removal of; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 10049-08-8, Ruthenium chloride (RuCl3)
RL: RGT (Reagent); RACT (Reactant or reagent)
(ruthenium source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 7772-99-8, Tin chloride (SnCl2), reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(tin source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 20193-56-0, Tungsten chloride (WCl3) 45000-93-9
RL: RGT (Reagent); RACT (Reactant or reagent)
(tungsten source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

IT 12260-63-8, Vanadic acid

RL: RGT (Reagent); RACT (Reactant or reagent)
(vanadium source; fabrication of long metal nanowires for use as catalysts in proton exchange membrane fuel cells)

L122 ANSWER 4 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2008:1136610 HCAPLUS Full-text
DN 149:387529
TI Catalytic Oxidation of H2 by N2O in the Gas Phase: O-Atom Transport with Atomic Metal Cations
AU Blagojevic, Voislav; Bozovic, Andrea; Orlova, Galina; Bohme, Diethard K.
CS Department of Chemistry, Centre for Research in Mass Spectrometry and Centre for Research in Earth and Space Science, York University, Toronto, ON, M3J 1P3, Can.
SO Journal of Physical Chemistry A (2008), 112(41), 10141-10146
CODEN: JPCAFH; ISSN: 1089-5639
PB American Chemical Society
DT Journal
LA English
AB Twenty-five atomic cations, M+, that lie within the thermodn. window for O-atom transport catalysis of the oxidation of hydrogen by nitrous oxide, have been checked for catalytic activity at room temperature with kinetic measurements using an inductively-coupled plasma/selected-ion flow tube (ICP/SIFT) tandem mass spectrometer. Only 4 of these 25 atomic cations were seen to be catalytic: Fe+, Os+, Ir+, and Pt+. Two of these, Ir+ and Pt+, are efficient catalysts, while Fe+ and Os+ are not. Eighteen atomic cations (Cr+, Mn+, Co+, Ni+, Cu+, Ge+, Se+, Mo+, Ru+, Rh+, Sn+, Te+, Re+, Pb+, Bi+, Eu+, Tm+, and Yb+) react too slowly at room temperature either in their oxidation with N2O to form MO+ or in the reduction of MO+ by H2. Many of these reactions are known to be spin forbidden and a few actually may lie outside the thermodn. window. Three alkaline-earth metal monoxide cations, CaO+, SrO+, and BaO+, were observed to favor MOH+ formation in their reactions with H2. A potential-energy landscape is computed for the oxidation of H2 with N2O catalyzed by Fe+(6D) that vividly illustrates the operation of an ionic catalyst and qual. accounts for the relative inefficiency of this catalyst.
CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 65, 73
ST catalytic oxidn hydrogen nitrous oxide gas phase; oxygen atom transport atomic metal cation
IT Density functional theory
(B3LYP; catalytic oxidation of H2 by N2O in gas phase and O-atom transport with atomic metal cations)
IT Electronic state
Energy

```
     Enthalpy
     Free energy
     Ion-molecule reaction
     Oxidation catalysts
     Potential energy surface
     Zero point energy
        (catalytic oxidation of H2 by N2O in gas phase and O-atom
        transport with atomic metal cations)
IT   Alkaline earth oxides
     RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
     process); PRP (Properties); RCT (Reactant); PROC (Process); RACT
     (Reactant or reagent); USES (Uses)
        (catalytic oxidation of H2 by N2O in gas phase and O-atom
        transport with atomic metal cations)
IT   Oxidation
        (catalytic; catalytic oxidation of H2 by N2O in
        gas phase and O-atom transport with atomic metal cations)
IT   Transition metals, uses
     RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
     process); PRP (Properties); RCT (Reactant); PROC (Process); RACT
     (Reactant or reagent); USES (Uses)
        (ions; catalytic oxidation of H2 by N2O in gas phase and
        O-atom transport with atomic metal cations)
IT   14067-02-8, Iron(1+), uses   14067-03-9, Chromium(1+),
     uses   14127-69-6, Manganese(1+), uses   14701-24-7, Selenium(1+),
     uses   14701-27-0, Lead(1+), uses   14903-34-5, Nickel
     (1+), uses   15065-79-9, Europium(1+), uses   15184-93-7,
     Thulium(1+), uses   15888-69-4, Germanium(1+), uses   16463-30-2,
     Bismuth(1+), uses   16610-75-6, Cobalt(1+), uses   16727-12-1,
     Molybdenum(1+), uses   17493-86-6, Copper(1+), uses   20019-76-5,
     Ruthenium(1+), uses   20205-78-1, Ytterbium(1+), uses   20561-52-8,
     Osmium(1+), uses   20561-56-2, Platinum(1+),
     uses   20561-58-4, Rhenium(1+), uses   20561-59-5, Rhodium(1+), uses
     21474-65-7, Tellurium(1+), uses   26288-30-2, Tin(1+), uses
     51403-88-4   54923-08-9, Iridium(1+), uses   55964-52-8   83018-04-6
     RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
     process); PRP (Properties); RCT (Reactant); PROC (Process); RACT
     (Reactant or reagent); USES (Uses)
        (catalytic oxidation of H2 by N2O in gas phase and O-atom
        transport with atomic metal cations)
IT   1333-74-0, Hydrogen, reactions   10024-97-2, Nitrous oxide,
     reactions   17778-80-2, Oxygen atom, reactions
     RL: PEP (Physical, engineering or chemical process); PRP
     (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or
     reagent)
        (catalytic oxidation of H2 by N2O in gas phase and O-atom
        transport with atomic metal cations)
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OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)
RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 5 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2007:618606 HCAPLUS Full-text
DN 147:12976
TI Stable electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports and polymer electrolyte fuel cells equipped therewith
IN Miyazaki, Kazuya
PA Canon Inc., Japan
SO Jpn. Kokai Tokkyo Koho, 10pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2007141626	A	20070607	JP 2005-333240	20051117
PRAI	JP 2005-333240		20051117		

AB The electrodes comprise catalysts, nanostructured supports, and nonstoichiometric titanium oxide intermediate layers doped with Pt, Al, Si, V, Cr, Fe, Co, Ni, Cu, Zn, Ge, Zr, Nb, Mo, Ru, Rh, Pd, Ag, In, Sn, Hf, Ta, W, Os, Ir, Au, La, Ce, and/or Nd. Thus, Magneli-phase titanium oxide layer and Pt-Pd (Pd 60 atomic%) catalyst layer were successively formed on graphite nanofiber layer (grown on quartz substrate) and treated under 10 kPa H at 600° for 10 min, in order to accelerate Pt-Pd alloying, size reduction, and dissoln. into the titanium oxide layer, to give electrode film.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67, 72
IT Catalysts
(electrocatalysts; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)
IT 12720-14-8, Palladium 60, platinum 40 (atomic) 39305-53-8, Cobalt 50, platinum 50 (atomic)
RL: CAT (Catalyst use); USES (Uses)
(electrocatalysts; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)

IT 7429-90-5, Aluminum, uses 7439-88-5, Iridium, uses 7439-89-6, Iron, uses 7439-91-0, Lanthanum, uses 7439-98-7, Molybdenum, uses 7440-00-8, Neodymium, uses 7440-02-0, Nickel, uses 7440-03-1, Niobium, uses 7440-04-2, Osmium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-21-3, Silicon, uses 7440-22-4, Silver, uses 7440-25-7, Tantalum, uses 7440-31-5, Tin, uses 7440-33-7, Tungsten, uses 7440-45-1, Cerium, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-56-4, Germanium, uses 7440-57-5, Gold, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-74-6, Indium, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use); USES (Uses) (titanium oxide intermediate layers doped with; stable PEFC electrodes having metal-doped nonstoichiometric titania intermediate layers between electrocatalyst layers and nanostructured supports)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L122 ANSWER 6 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2007:427983 HCAPLUS Full-text

DN 147:59864

TI Oxygen Reduction Activity of Carbon-Supported Pt-M (M = V, Ni, Cr, Co, and Fe) Alloys Prepared by Nanocapsule Method

AU Yano, Hiroshi; Kataoka, Mikihiro; Yamashita, Hisao; Uchida, Hiroyuki; Watanabe, Masahiro

CS Clean Energy Research Center, University of Yamanashi, Takeda 4, Kofu, 400-8510, Japan

SO Langmuir (2007), 23(11), 6438-6445
CODEN: LANGD5; ISSN: 0743-7463

PB American Chemical Society

DT Journal

LA English

AB Monodispersed Pt and Pt-M (M = V, Cr, Fe, Co, and Ni) alloy nanoparticles supported on C black (denoted as Pt/CB and Pt-M/CB) were prepared by the simultaneous reduction of Pt acetylacetonate and the 2nd metal acetylacetonate within nanocapsules formed in di-Ph ether in the presence of C black. For the Pt/CBs, the average Pt diams. measured by scanning TEM (STEM) or XRD ranged from 2.0 to 2.5 nm, regardless of the catalyst-loading level from 10 to 55% on CB. The alloy composition is well-controlled to the projected value among the supported particles. The activities for the oxygen reduction reaction (ORR) at Nafion-coated catalysts in O2-saturated 0.1M HClO4 solution were evaluated by using a channel flow electrode (CFE) cell at 30°. The area-specific ORR activities at Pt-M/CB are 1.3 to 1.8

times higher than that at Pt/CB. The ORR activity increased in the order Pt/CB < Pt-Ni/CB < Pt-Fe/CB < Pt-Co/CB < Pt-V/CB < Pt-Cr/CB.

CC 72-2 (Electrochemistry)
Section cross-reference(s): 52, 56, 67, 78

IT Reduction catalysts
(electrochem.; Pt alloys supported on carbon black for oxygen)

IT Capsules
(nanocapsules; reduction of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetonates in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

IT Reduction
(of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetonates in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

IT Carbon black, uses
RL: CAT (Catalyst use); USES (Uses)
(reduction of bis(acetylacetonato)platinum with chromium and vanadium and iron-group acetylacetonates in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

IT 100471-45-2P, Iron 40.6, platinum 59.4 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(electrocatalysts prepared by ethylene glycol reduction method and supported on carbon black for oxygen reduction and comparison with alloy prepared by nanocapsule method)

IT 11123-71-0P, Iron 56.6, platinum 43.4 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(electrocatalysts prepared by nanocapsule method and supported on carbon black for oxygen reduction)

IT 37274-26-3P, Iron 50, platinum 50 (atomic) 56712-62-0P, Cobalt 54, platinum 46 (atomic) 940861-90-5P, Platinum 53, vanadium 47 (atomic) 940861-91-6P, Chromium 51, platinum 49 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(oxygen reduction activity of carbon-supported Pt alloy electrocatalysts prepared by nanocapsule method by reduction of acetylacetonates)

IT 7440-06-4P, Platinum, uses 53590-11-7P, Nickel 45,

platinum 55 (atomic)
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); USES (Uses)
(oxygen reduction activity of carbon-supported Pt and Pt alloy electrocatalysts prepared by nanocapsule method by reduction of acetylacetonates)

IT 3264-82-2, Bis(acetylacetonato)nickel 13476-99-8, Tris(acetylacetonato)vanadium 14024-18-1, Tris(acetylacetonato)iron 21679-31-2, Tris(acetylacetonato) chromium 21679-46-9, Tris(acetylacetonato)cobalt
RL: RCT (Reactant); RACT (Reactant or reagent)
(simultaneous reduction with bis(acetylacetonato)platinum in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

IT 15170-57-7, Bis(acetylacetonato)platinum
RL: RCT (Reactant); RACT (Reactant or reagent)
(simultaneous reduction with chromium and vanadium and iron-group acetylacetonates in nanocapsules formed in di-Ph ether in presence of carbon black for Pt alloy electrocatalysts for oxygen reduction)

OSC.G 16 THERE ARE 16 CAPLUS RECORDS THAT CITE THIS RECORD (16 CITINGS)

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 7 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2007:214859 HCAPLUS Full-text
DN 146:340995
TI Method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid
IN Mu, Shichun; Cheng, Niancai; Pan, Mu; Yuan, Runzhang
PA Wuhan University of Technology, Peop. Rep. China
SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 8pp.
CODEN: CNXXEV
DT Patent
LA Chinese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1917260	A	20070221	CN 2006-10020004	20060817
	CN 100399612	C	20080702		
PRAI	CN 2006-10020004		20060817		

AB The title method comprises: (1) preparing proton-conductive high polymer modified nanoscale noble metal colloid with particle size of 2-5 nm, and (2) depositing on a carbon carrier (nanoscale carbon black, nanoscale graphite balls with particle size of 10-100 nm or mesoporous carbon microballs with particle size of 2-50 nm). The high polymer in step 1 is one of perfluorosulfonic acid resin, sulfonated polysulfone resin, sulfonated polybenzimidazole, sulfonated polyphenylenesulfide resin, sulfonated polyphosphazene, sulfonated polyimide resin, sulfonated polystyrene resin and sulfonated polyetheretherketone resin. The introduction of proton-conductive high polymer can increase the steric hindrance of noble metal microparticles that can anchor on the carrier. In addition, proton-conductive high polymer can increase the bonding force between the noble metal microparticles and the carrier. The obtained **catalyst** is processed into fuel cell chip **catalyst** coated membrane (CCM), and assembled into single cell to improve the elec. output performance.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 67, 76

ST proton conductive fuel cell **catalyst** polymer nanoparticle chip

IT Integrated circuits
Microspheres
Nanoparticles
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Carbon black, uses
RL: CAT (Catalyst use); USES (Uses)
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Sulfonic acids, uses
RL: CAT (Catalyst use); USES (Uses)
(perfluoro; method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Polyketones
RL: CAT (Catalyst use); USES (Uses)
(polyether-, sulfonated; method for manufacturing proton-conductive fuel cell **catalyst** composed of high polymer modified nanoscale noble metal colloid)

IT Polyethers, uses
RL: CAT (Catalyst use); USES (Uses)

```
        (polyketone-, sulfonated; method for manufacturing proton-
conductive
        fuel cell catalyst composed of high polymer modified
        nanoscale noble metal colloid)
IT   Fuel cells
        (proton exchange membrane; method for manufacturing proton-
conductive
        fuel cell catalyst composed of high polymer modified
        nanoscale noble metal colloid)
IT   Polybenzimidazoles
     Polyimides, uses
     Polyphosphazenes
     Polysulfones, uses
     Polythiophenylenes
     RL: CAT (Catalyst use); USES (Uses)
        (sulfonated; method for manufacturing proton-conductive fuel cell
        catalyst composed of high polymer modified nanoscale
        noble metal colloid)
IT   Perfluoro compounds
     RL: CAT (Catalyst use); USES (Uses)
        (sulfonic acids; method for manufacturing proton-conductive fuel
cell
        catalyst composed of high polymer modified nanoscale
        noble metal colloid)
IT   Platinum alloy, base
     RL: CAT (Catalyst use); USES (Uses)
        (method for manufacturing proton-conductive fuel cell catalyst
        composed of high polymer modified nanoscale noble metal colloid)
IT   7439-88-5, Iridium, uses   7439-89-6, Iron, uses   7439-96-5,
     Manganese, uses   7439-98-7, Molybdenum, uses   7440-02-0,
     Nickel, uses   7440-04-2, Osmium, uses   7440-05-3,
     Palladium, uses   7440-06-4, Platinum, uses   7440-16-6, Rhodium,
     uses   7440-18-8, Ruthenium, uses   7440-31-5, Tin, uses
     7440-32-6, Titanium, uses   7440-44-0, Carbon, uses   7440-47-3,
     Chromium, uses   7440-48-4, Cobalt, uses   7440-50-8,
     Copper, uses   7440-55-3, Gallium, uses   7440-62-2, Vanadium, uses
     7782-42-5, Graphite, uses   9003-53-6D, Polystyrene, sulfonated
     31694-16-3D, sulfonated   63627-81-6, Platinum 70,
     ruthenium 30 (atomic)   929088-22-2,
     Chromium 10, platinum 70, ruthenium 20 (
     atomic)
     RL: CAT (Catalyst use); USES (Uses)
        (method for manufacturing proton-conductive fuel cell catalyst
        composed of high polymer modified nanoscale noble metal colloid)
IT   56-81-5, Glycerol, uses   64-17-5, Ethanol, uses   67-56-1,
     Methanol, uses   67-63-0, Isopropanol, uses   71-23-8, Propanol,
     uses   107-21-1, Ethylene glycol, uses   25265-75-2, Butanediol
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RL: NUU (Other use, unclassified); USES (Uses)
(method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid)

IT 10025-73-7, Chromium trichloride 10049-08-8, Ruthenium trichloride 16941-12-1, Chloroplatinic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid)

IT 1310-73-2, Sodium hydroxide, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid)

IT 7440-57-5, Gold, uses 9002-84-0, Polytetrafluoroethylene 12597-68-1, Stainless steel, uses 359816-85-6, Nafion NRE 211
RL: TEM (Technical or engineered material use); USES (Uses)
(method for manufacturing proton-conductive fuel cell catalyst composed of high polymer modified nanoscale noble metal colloid)

L122 ANSWER 8 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2006:870046 HCAPLUS Full-text
DN 145:427834
TI Electro-oxidation of dimethyl ether on Pt/C and PtMe/C catalysts in sulfuric acid
AU Liu, Yan; Mitsushima, Shigenori; Ota, Ken-Ichiro; Kamiya, Nobuyuki
CS Chemical Energy Laboratory, Yokohama National University, Yokohama-shi, 240-8501, Japan
SO Electrochimica Acta (2006), 51(28), 6503-6509
CODEN: ELCAAV; ISSN: 0013-4686
PB Elsevier B.V.
DT Journal
LA English
AB The electrooxidn. of di-Me ether (DME) on PtMe/C (Me = Ru, Sn, Mo, Cr, Ni, Co, and W) and Pt/C electro-catalysts were studied in an aqueous half-cell, and compared to the MeOH oxidation The addition of a 2nd metal enhanced the tolerance of Pt to the poisonous species during the DME oxidation reaction (DOR). The PtRu/C electro-catalyst showed the best electro-catalytic activity and the highest tolerance to the poisonous species in the low over-potential range (<0.55 V, 50°) among the binary electro-catalysts and the Pt/C, but at the higher potential (>ca. 0.55 V, 50°), the Pt/C behaved better than PtRu/C. The apparent activation energy for the DOR decreased in the order: PtRu/C (57 kJ mol-1) > Pt3Sn/C (48 kJ mol-1) ≈ Pt/C (46 kJ mol-1). However, the activation energy for the MOR showed a different turn, decreased in the following order: Pt/C (43 kJ mol-1) > Pt3Sn/C (35 kJ mol-1) ≈ PtRu/C (34 kJ mol-1). The temperature dependence of the DOR was greater than that of the oxidation of MeOH (MOR) on the PtRu/C.

CC 72-2 (Electrochemistry)
Section cross-reference(s): 22, 52, 66, 67
ST electrooxidn dimethyl ether carbon supported platinum catalyst sulfuric acid; alloy binary platinum carbon supported catalyst dimethyl ether electrooxidn
IT Surface area
(carbon-supported Pt and Pt alloys for di-Me ether electrochem. oxidation catalysts)
IT Oxidation catalysts
(electrochem.; carbon-supported Pt and Pt alloys for di-Me ether)
IT 7440-06-4, Platinum, uses 12714-36-2, Platinum 50, ruthenium 50 (atomic) 37256-04-5, Nickel 50, platinum 50 (atomic)
37365-44-9, Platinum 75, tin 25 (atomic
) 39305-53-8, Cobalt 50, platinum 50 (atomic) 77622-66-3, Platinum 50, tungsten 50 (atomic) 110669-45-9, Chromium 33.3, platinum 66.7 (atomic)
190711-69-4, Molybdenum 25, platinum 75 (atomic)
RL: CAT (Catalyst use); USES (Uses)
(carbon-supported catalysts; di-Me ether electrochem. oxidation in sulfuric acid solution on)
OSC.G 10 THERE ARE 10 CAPLUS RECORDS THAT CITE THIS RECORD (10 CITINGS)
RE.CNT 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 9 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN
AN 2006:839187 HCAPLUS Full-text
DN 145:441246
TI Alloy Electrocatalysts
AU He, T.; Kreidler, E.; Xiong, L.; Luo, J.; Zhong, C. J.
CS Honda Research Institute USA, Incorporated, Columbus, OH, 43212, USA
SO Journal of the Electrochemical Society (2006), 153(9), A1637-A1643
CODEN: JESOAN; ISSN: 0013-4651
PB Electrochemical Society
DT Journal
LA English
AB Improving efficiency and reducing overall cost are necessary for the commercialization of fuel cell-powered vehicles. Electrocatalysts play an important role, particularly in the cathode, where the O reduction reaction is sluggish and the noble metal loading is relatively high. To discover less expensive and more active cathode catalysts, a novel combinatorial workflow was developed to study alloy-based electrocatalysts. In addition to the discovery program, various synthesis technologies were studied and developed to engineer nanoscale catalyst particles with controllable size, monodispersity, and microcomposition. These research activities are reported with a

focus on the activity-stability-composition relation for Pt-based metal alloys.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67

IT Fuel cell cathodes
(catalytic; alloy electrocatalysts for fuel cell cathodes)

IT Catalysts
(electrocatalysts; alloy electrocatalysts for fuel cell cathodes)

IT Reduction catalysts
(electrochem.; alloy electrocatalysts for fuel cell cathodes)

IT 39349-60-5 39349-61-6 39349-62-7 39349-63-8 39441-85-5
39454-05-2 51399-11-2 51403-08-8 53071-52-6 55777-15-6
60952-32-1 76931-28-7 77506-59-3, Chromium 50,
platinum 50 (atomic) 122912-04-3, Platinum base, selenium
141020-73-7 154635-81-1, Iron, nickel, platinum base
162163-00-0 178986-30-6, Molybdenum, platinum base 912807-59-1,
Chromium 64, platinum 36 (atomic
) 912807-61-5, Iron, platinum base, vanadium
RL: CAT (Catalyst use); DEV (Device component use); PRP (Properties); USES (Uses)
(alloy electrocatalysts for fuel cell cathodes)

OSC.G 28 THERE ARE 28 CAPLUS RECORDS THAT CITE THIS RECORD (28 CITINGS)

RE.CNT 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 10 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2005:172023 HCAPLUS Full-text

DN 142:226555

TI O-Atom Transport Catalysis by Atomic Cations in the Gas Phase: Reduction of N2O by CO

AU Blagojevic, Voislav; Orlova, Galina; Bohme, Diethard K.

CS Department of Chemistry, Centre for Research in Mass Spectrometry and Centre for Research in Earth and Space Science, York University, Toronto, ON, M3J 1P3, Can.

SO Journal of the American Chemical Society (2005), 127(10), 3545-3555
CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

AB Atomic cations (26), M+, have been shown to lie within a thermodn. window for O-atom transport catalysis of the reduction of N2O by CO and have been checked for catalytic activity at room temperature with kinetic measurements using an inductively-coupled plasma/selected-ion flow tube (ICP/SIFT) tandem mass spectrometer. Only 10 of these 26 atomic cations were seen to be catalytic: Ca+, Fe+, Ge+, Sr+, Ba+,

Os+, Ir+, Pt+, Eu+, and Yb+. The remaining 16 cations that lie in the thermodn. window (Cr+, Mn+, Co+, Ni+, Cu+, Se+, Mo+, Ru+, Rh+, Sn+, Te+, Re+, Pb+, Bi+, Tm+, and Lu+) react too slowly at room temperature either in the formation of MO+ or in its reduction by CO. Many of these reactions are known to be spin forbidden and a few actually may lie outside the thermodn. window. A new measure of efficiency is introduced for catalytic cycles that allows the discrimination between catalytic cations on the basis of the efficiencies of the two legs of the catalytic cycle. Also, a potential-energy landscape is computed for the reduction of N2O by CO catalyzed by Fe+(6D) that vividly illustrates the operation of an ionic catalyst .

CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 59, 73

ST oxyen atom transport catalysis metal cation gas phase; redn nitrogen carbon oxide gas phase catalysis metal cation

IT Cations
(O-atom transport catalysis by atomic cations in gas phase and reduction of NO by CO)

IT Electronic state
Potential energy surface
Reduction catalysts
Reduction enthalpy
Reduction kinetics
(O-atom transport catalysis by atomic cations in gas phase and reduction of N2O by CO)

IT Rare earth metals, uses
Transition metals, uses
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(ions; O-atom transport catalysis by atomic cations in gas phase and reduction of N2O by CO)

IT 14067-02-8, Iron(1+), uses 14067-03-9, Chromium(1+), uses 14102-48-8, Calcium(1+), uses 14127-69-6, Manganese(1+), uses 14701-18-9, Strontium(1+), uses 14701-24-7, Selenium(1+), uses 14701-27-0, Lead(1+), uses 14903-34-5, Nickel (1+), uses 15065-79-9, Europium(1+), uses 15184-93-7, Thulium(1+), uses 15888-69-4, Germanium(1+), uses 16463-30-2, Bismuth(1+), uses 16541-35-8, Barium(1+), uses 16610-75-6, Cobalt(1+), uses 16727-12-1, Molybdenum(1+), uses 16887-05-1, Lutetium1+), uses 17493-86-6, Copper (1+), uses 20019-76-5, Ruthenium(1+), uses 20205-78-1, Ytterbium(1+), uses 20561-52-8, Osmium (1+), uses 20561-56-2, Platinum(1+), uses 20561-58-4, Rhenium(1+), uses 20561-59-5, Rhodium(1+), uses 21474-65-7, Tellurium(1+), uses 26288-30-2, Tin(1+), uses 54923-08-9, Iridium(1+), uses

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     RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
        (O-atom transport catalysis by atomic cations in
        gas phase and reduction of N2O by CO)
IT   17778-80-2, Oxygen atom, processes
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); PROC (Process)
        (O-atom transport catalysis by atomic cations in gas phase
        and reduction of N2O by CO)
IT   630-08-0, Carbon monoxide, reactions   10024-97-2, Nitrous oxide,
     reactions
     RL: CPS (Chemical process); PEP (Physical, engineering or chemical
     process); PRP (Properties); RCT (Reactant); PROC (Process); RACT
     (Reactant or reagent)
        (O-atom transport catalysis by atomic cations in gas phase
        and reduction of N2O by CO)
OSC.G   27    THERE ARE 27 CAPLUS RECORDS THAT CITE THIS RECORD (27
              CITINGS)
RE.CNT  26    THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 11 OF 12  HCAPLUS  COPYRIGHT 2009 ACS on STN
AN   2003:222203  HCAPLUS  Full-text
DN   138:224245
TI   Process for producing electrode catalyst for fuel cell
IN   Hiroshima, Kazutaka; Asaoka, Takahiko; Ohya, Yutaka; Noritake,
     Tatsuo; Kato, Hisao; Nagami, Tetsuo
PA   Toyota Jidosha Kabushiki Kaisha, Japan
SO   U.S. Pat. Appl. Publ., 9 pp.
     CODEN: USXXCO
DT   Patent
LA   English
FAN.CNT 1
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	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 20030054227	A1	20030320	US 2002-228338	20020827
	US 6911278	B2	20050628		
	JP 2003092114	A	20030328	JP 2001-282075	20010917
	CA 2402183	A1	20030317	CA 2002-2402183	20020910
	CA 2402183	C	20080408		
	DE 10242911	A1	20030410	DE 2002-10242911	

200209
16

PRAI JP 2001-282075 A 20010917
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB An electrode catalyst for a fuel cell includes a conductive support, and catalytic particles loaded on the conductive support. The catalytic particles include platinum and a base metal being on the lower end of the electrochem. series with respect to platinum. The number of the atoms of the base metal, forming metallic oxides without alloying with the platinum, is less than 5 atomic% of the number of the atoms of the platinum on a surface of the catalytic particles. The electrode catalyst is produced by loading the platinum and base metal on the conductive support, alloying the platinum and base metal thereon by a heat treatment, thereby making the catalytic particles, and removing metallic oxides from a surface of the catalytic particles. The electrode catalyst is less expensive comparatively, exhibits high catalytic activities, and hardly lowers the battery performance of fuel cells.

IC ICM H01M004-88
ICS H01M004-92
INCL 429044000; 502101000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56, 67
ST electrode catalyst prepn fuel cell
IT Catalysts
(electrocatalysts; process for producing electrode catalyst for fuel cell)
IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; process for producing electrode catalyst for fuel cell)
IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; process for producing electrode catalyst for fuel cell)
IT Ionomers
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; process for producing electrode catalyst for fuel cell)
IT Alloying
Fuel cell electrodes
Heat treatment
(process for producing electrode catalyst for fuel cell)
IT Carbon black, uses
Carbonaceous materials (technological products)

RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(process for producing electrode catalyst for fuel cell)

IT Fuel cells
(solid electrolyte; process for producing electrode catalyst for fuel cell)

IT 7439-89-6, Iron, uses 7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses 7440-02-0, Nickel, uses 7440-06-4, Platinum, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-62-2, Vanadium, uses 39339-47-4
RL: CAT (Catalyst use); USES (Uses)
(process for producing electrode catalyst for fuel cell)

IT 12325-31-4, DiSodium Hexahydroxyplatinate 127796-19-4, Platinum sulfite
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(process for producing electrode catalyst for fuel cell)

IT 7664-93-9, Sulfuric acid, uses
RL: MOA (Modifier or additive use); USES (Uses)
(process for producing electrode catalyst for fuel cell)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (12 CITINGS)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD ALL CITATIONS AVAILABLE IN THE RE FORMAT

L122 ANSWER 12 OF 12 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1987:563892 HCAPLUS Full-text

DN 107:163892

OREF 107:26200h,26201a

TI Electrocatalysis of the hydrogen oxidation and of the oxygen reduction reactions on platinum and some alloys in alkaline medium

AU Couturier, G.; Kirk, D. W.; Hyde, P. J.; Srinivasan, S.

CS Dep. Chem. Eng., Univ. Toronto, Toronto, ON, M5S 1A4, Can.

SO Electrochimica Acta (1987), 32(7), 995-1005
CODEN: ELCAAV; ISSN: 0013-4686

DT Journal

LA English

AB The objectives of the present study were to find substitutes for Pt as electrocatalysts for alkaline fuel cells. For this purpose, electrode kinetic studies were carried out for the H oxidation reaction on the metals Pt and Ni, and on the alloys Pt-Ni, Pt-Ti and Ni-Ti and for the O reduction on Pt and the alloys Pt-Cr, Pt-Ta and Pt-Cr-Ta. For economic reasons, the electrodes were in the form of

sputtered films on glass disks which could be mounted on the shaft of a rotating disk electrode apparatus The rotating disk electrode expts. were conducted in 1N KOH at 23-70°. The cyclic voltammetric technique was used to characterize the electrodes in the potential range of interest for fuel cell reactions. Analyses of the surface and bulk compns. of the alloys were made using Auger electron spectroscopy, electron spectroscopy by chemical anal. or energy dispersive x-ray techniques. Although for the H oxidation reactions Pt was the best electrocatalyst, Ni and Pt-Ti could be considered as potential substitutes. The results for Pt substitution were more encouraging for the O reduction reaction. The alloy Pt-Cr-Ta showed a considerably better performance than did Pt. This alloy displayed a single Tafel slope (45 mV/decade) at 55 and 70°, while 2 Tafel slopes were observed for all other electrodes. The Pt-Ta alloy also exhibited a better electrode kinetic behavior and like Pt-Cr-Ta is a potential substitute for Pt for this reaction.

CC 72-2 (Electrochemistry)
Section cross-reference(s): 52, 67

ST hydrogen oxidn electrochem electrocatalyst; oxygen redn electrochem electrocatalyst; kinetics hydrogen electrooxidn oxygen electroredn; electrooxidn kinetics hydrogen catalyst; electroredn kinetics oxygen platinum alloy; platinum alloy electrocatalyst hydrogen oxygen; nickel electrocatalyst hydrogen oxidn

IT Oxidation, electrochemical
(of hydrogen on nickel and platinum and their alloys in alkaline solution)

IT Oxidation catalysts
(electrochem., nickel and platinum and sputtered platinum-nickel alloys, for hydrogen in alkaline solution)

IT Kinetics of oxidation
(electrochem., of hydrogen on nickel and platinum and sputtered platinum and nickel alloys in alkaline solution)

IT Reduction catalysts
(electrochem., platinum and sputtered platinum alloys, for oxygen in alkaline solns.)

IT Electric current
(exchange, in hydrogen oxidation on nickel and platinum and their alloys and oxygen reduction on platinum and its alloys in alkaline solution)

IT Electrodes
(fuel-cell, catalytic, platinum and nickel and their alloys)

IT 7440-02-0, Nickel, uses and miscellaneous
RL: USES (Uses)
(electrocatalyst, for hydrogen oxidation in alkaline solution)

IT 12683-48-6 67055-25-8, Nickel 40, platinum 60 (atomic)

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     110669-44-8, Platinum 66, titanium 34 (
     atomic)
     RL: PRP (Properties)
        (hydrogen electrochem. evolution kinetics on, in alkaline
solution,
        electrocatalyst in relation to)
IT   1333-74-0, Hydrogen, reactions
     RL: RCT (Reactant); RACT (Reactant or reagent)
        (oxidation of, electrochem., on platinum and sputtered platinum
        alloys and nickel-titanium alloys, in alkaline solns.,
        electrocatalyst in relation to)
IT   110669-45-9, Chromium 34, platinum 66 (atomic)
     110669-46-0, Platinum 66, tantalum 34 (
     atomic)   110669-47-1, Chromium 20,
     platinum 66, tantalum 14 (atomic)
     RL: PRP (Properties)
        (oxygen electroredn. kinetics on, in alkaline solution,
electrocatalyst
        in relation to)
OSC.G   13     THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13
               CITINGS)


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